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**Written Testimony Submitted by Kerry O'Neill, Executive Director  
Clean Energy Finance Center**

**Before The Connecticut General Assembly Energy and Technology Committee  
March 15, 2011**

**Concerning Senate Bill 1: An Act Concerning Energy Policy and Finance**

The Clean Energy Finance Center (CEFC) appreciates the opportunity to submit testimony to the Energy and Technology Committee regarding SB 1: An Act Concerning Energy Policy and Finance. This testimony addresses only the financing provisions of the bill.

The mission of the non-profit CEFC, based in Connecticut, is to develop innovative approaches to attract greater private and public sector capital to finance large-scale energy efficiency, renewable energy and carbon reduction initiatives. The CEFC combines objective, timely analysis with extensive stakeholder engagement to drive successful policy and market outcomes at the state and local level. The CEFC was founded in 2010 by Earth Markets, LLC and the Emily Hall Tremaine Foundation, which also provides funding for the Center.

The CEFC commends the Committee for supporting renewable energy and energy efficiency projects in so many different ways in SB 1. Your ongoing commitment to clean energy in our state is critical to securing Connecticut's place at the forefront of the clean energy economy.

The CEFC has been analyzing energy financing strategies being deployed across the country to achieve maximum leverage of public sector dollars when combined with private sector capital. We have also analyzed various financing options available within the state of Connecticut. And while we have several financing options available – with more contemplated in SB 1 – none of these are at the scale necessary to achieve the desired impact.

So for our state to truly take advantage of the opportunity before us to create a robust in-state clean energy sector, the CEFC believes it is time to support clean energy finance in a focused and coordinated way.

**The CEFC recommends the establishment of a financing entity – call it the Connecticut Energy Investment Fund for now – that will provide low cost financing for energy efficiency and clean energy projects by using existing sources of funds as well as private capital market funds. The new Fund would require no new appropriations, but would use re-allocated existing funds.**

**What can Connecticut gain from this Fund?**

- Create a foundation for job creation in the new energy economy
- Lower the cost of energy efficiency and clean energy projects
- Maximize scarce public resources to access private capital at a minimum of 5 to 1 leverage

- \$1 investment from Fund can support \$5 or more of lending – we think Connecticut investors would step up to this challenge
- Achieve the scale necessary to address the market need
- Make Connecticut more attractive to private capital investment
- Ensure “all fuels” solutions for all sectors

### **Why is this Fund needed?**

The case for centralization is to bring scale to financing to help programs and companies achieve scale in their energy efficiency and renewable energy investments:

- Brings together energy efficiency and clean energy financing silos
- Creates a “one-stop shop” for customers, eliminating the fragmentation that currently exists
- Develops the specialized expertise required for clean energy finance – all under one roof
- Supports standardization of financing contracts – this supports scale, as well as speed of processing, and it keeps transaction costs down
- Collects rigorous statistics on the actual energy savings from clean energy projects
  - In this way, the Fund can differentiate itself as a superior investment

### **What would the initial focus of the Fund be?**

1. Bring building energy efficiency to scale for residential, commercial, public sector – state and local buildings a particularly ripe opportunity
  - Energy savings performance contracting
  - Revolving loan funds and loan loss reserves
  - Commercial PACE, bundling of smaller projects
2. Promote distributed and small-scale clean energy generation

### **What is needed from the Legislature?**

1. Establish the Fund as a quasi-governmental entity
2. Enable energy savings performance contracting
  - HB 6544 An Act Concerning Energy Efficiency – CEFC has been working with stakeholders to strengthen this
3. Enable Property Assessed Clean Energy (PACE)
  - But reinstate the senior lien status, per last year’s version of the legislation
  - Commercial PACE can go forward today with senior lien status. A subordinate lien status for Commercial PACE doesn’t offer any advantages.
  - There are efforts at the national level to allow PACE for residential – if this is successful, we want Connecticut to be able to move forward without additional legislation.

Thank you for the effort you are making to address clean energy finance issues in Connecticut. I have attached a PowerPoint presentation that describes the Fund in much more detail. Please feel free to contact me at any time if you have questions about these issues.

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# Connecticut Energy Investment Fund

Job Creation in Connecticut's Clean Energy Economy  
Through Public-Private Financing and Deployment of  
Clean Energy and Energy Efficiency Projects

March 2011



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# Who Are We?

✦ **Coalition for Green Capital** – the Coalition for Green Capital (CGC) is a non-profit organization that exists for the purpose of advocating tax and finance policies that support investment in energy efficiency and clean energy. CGC pursues such policies at the national, state and international level.

✦ **Clean Energy Finance Center** – the Clean Energy Finance Center (CEFC) is a recently established non-profit organization that serves as a nexus for objective research and analyses of clean energy and energy efficiency finance and as a catalyst for economic development for the State of Connecticut by building a new cluster in the emerging sector of environmental finance.



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# Goal: Increase jobs from and investment in a clean and efficient energy economy

Connecticut can create 20,000 jobs through the investment of \$200M annually and transition to a clean energy economy by

1. Upgrading buildings with deep energy retrofits – 15% of residential and commercial buildings by 2020 and 50% of state, municipal, school buildings by 2020
2. Investing in distributed generation and the electrification of the state's fleet
3. Reducing consumers' energy bills

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Attracting new private investment into Connecticut



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# Opportunity: \$1 = \$5 = \$35

Here's how \$1 in public investment can return at least \$35 in Gross State Product (GSP) in

Connecticut through a private sector multiplier:

1. \$1 in invested in Energy Efficiency in CT returns \$7 in GSP
2. \$1 in public investment can be matched, or “leveraged”, with \$5 or more of private capital
3. Every \$1 public of investment can enable at least \$5 of total efficiency investments in CT, which in turn yields \$35 in GSP  
( $\$1 \times \$5 \times \$7 = \$35$ )



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# Problem: Major obstacles to achieving clean energy investments and job creation

## Connecticut faces several major obstacles :

1. Connecticut must address rising electricity rates
2. Connecticut cannot add to state spending
3. Connecticut needs to remove the energy agency silos and market barriers to scaling up investments in clean and efficient energy
4. Connecticut needs “all fuels” efficiency solutions
5. Private capital seeking to invest in clean energy is driven to states or countries with attractive public financing options



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# Solution: CT Energy Investment Fund, a Public-Private Partnership

## Connecticut Energy Investment Fund

- ◆ Combines currently existing entities and funds into a single organization to advance Connecticut's clean energy economy
- ◆ Serves as a catalyst for public-private partnerships to scale investments in clean energy and energy efficiency in our communities – and allows public dollars to go further
- ◆ Invests in Energy Efficiency, Distributed Generation, and Electrification of Vehicles
- ◆ Targets Commercial, Residential, and Public Buildings and Public Fleets



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# What can Connecticut gain from a CT Energy Investment Fund?

**Bringing together the clean energy and energy efficiency financing silos would:**

1. Create foundation for job creation in the new energy economy
  2. Maximize scarce public resources to access private capital at a minimum of 5 to 1 leverage
    - ★ Reducing the annual public investment needed for financing to a max of \$30M
  3. Achieve scale necessary to address the market need
  4. Make Connecticut more attractive to private capital investment
- Ensure “all fuels” solutions for all sectors



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# Action: Create an Investment Fund

## What problems does clean investment face in Connecticut?

Market fragmentation in sources of financing and information results in lack of leverage

Company "clients" and programs have difficulty in getting to scale: a chicken and the egg problem that with increased scale costs decline, but without scale costs are high

High financing costs (in rate and in time) make getting scale even tougher

There are some government programs, but they are scattered; because knowledge is specialized there is a lot of "re-inventing the wheel"

The solution: Create a new CT Energy Investment Fund that centralizes existing programs and is granted other authorities

"The case for centralization is to bring scale to financing to help programs and companies achieve scale"

One-stop shopping and specialized knowledge

Ability to scale financing

The entity would be able to attract more funding

Standardization in financing contracts

Will speed processing, lower costs, and permit aggregation of projects for funding

# Where would funding for an Investment Fund come from?

## Existing Public Sources of Capital in Connecticut

Ratepayer funds, RGGI funds, forward capacity market revenue, REC sales, state pension fund investments, Green Loan Guaranty Fund, Qualified Energy Conservation Bonds, federal grants

## Federal Funding

- Existing federal programs could be utilized for funding
- An EIT (see Appendix) could provide capital to the CT Energy Investment Fund

## Private Sources of Capital in Connecticut

Banks, ESCOs, capital markets, mission-related investors, pension funds, insurance companies, other private investors

## Additional Funding Can Be Generated Through:

- Regulatory changes
- State tax policy
- Long-term, low-cost financing coupled with power purchasing agreements



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# Investment Fund would optimize public financing by combining funds

## Strategies to Maximize Public Public/Private Investment in Connecticut

- Leveraging capital provided
- Existing bond issues
- "Investment-grade" measurement & verification
- Aggregation services
- Interest rate buy downs
- Coordination with other marketing & workforce development initiatives
- On-bill repayment

## More effective use of limited public financing resources

- ✦ Combine public financing for projects that require multiple forms and sources of public financing support, including financing support from a complementary proposed federally-created Energy Investment Trust
- ✦ Develop a core set of experienced staff to increase effectiveness of limited public financing resources and reduce overall administrative costs

## Make public financing more attractive as an inducement for significant private capital investments

- ✦ "One-stop-shopping" will simplify public financing for private developers and capital sources, and thereby encourage greater private investment
- ✦ Investment Fund can validate worthiness of projects for private investment



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# Investment Fund could be seeded with \$30M from existing sources of funds

Over \$140M in Public Investment for Clean Energy & Energy Efficiency  
 Currently Exists in Silos with Little to No Leverage – A \$30M Public  
 Investment Could Be Leveraged to \$200M of Efficiency Financing

Entity or Source	Amount of Funds Annually
Connecticut Clean Energy Fund	\$30 MM
Connecticut Energy Efficiency Fund – ratepayer – other (ISO-NE revenues, Class III RECs)	\$60 MM \$20 MM
Connecticut Green Loan Guarantee Fund	\$5 MM
Connecticut Housing Investment Fund and energy loan program	\$3 MM
Qualified Energy Conservation Bonds	\$6 MM
Regional Greenhouse Gas Initiative avail for CE and EE	\$16 MM

# Energy efficiency market is poised to expand greatly with proper guidance

Financing is an area of market failure in energy efficiency – these investments have a quick payback (and therefore have high rates of returns) but cannot be easily financed

- ✦ Many projects are small
- ✦ There is no standardization for performance of technology upgrades, documentation, security for lenders (against default, fraud), contracts
- ✦ Bank capital rules will continue to make bank lending difficult to obtain
- ✦ Private investors (endowments, individuals, investment managers) have expressed interest in investing in energy efficiency but limited amount of assets and lack of standardization of underwriting standards and contracts prevent participation



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# Energy efficiency market is poised to expand greatly with proper guidance

The CT Energy Investment Fund has the opportunity to solve this market failure in financing

- ✦ Establish market standards for the energy upgrades, the lending, and the monitoring of savings
- ✦ Demonstrate "proof of concept" to private investors to develop private market in energy efficiency investing
- ✦ Aggregate smaller projects and bundle into larger projects to secure affordable up-front financing
- ✦ "Purchase" the loans from completed projects then aggregate for sale to private investors
- ✦ Create a pipeline of projects and that can satisfy private market demand



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# Renewable Energy will also be galvanized

- ✦ Connecticut's RPS is being met almost exclusively by RECs purchased from outside of Connecticut
- ✦ Low-cost financing could make Connecticut renewable energy projects competitive with out of state sources of RECs
- ✦ Low-cost financing will reduce the cost of projects significantly (see appendix) while ensuring maximum efficiency in the usage of state funds
- ✦ Private capital will be a critical driver of the industry



# Connecticut Energy Investment Fund should have three areas of focus

1. **Bringing building energy efficiency to scale for residential, commercial, public sector**
  - ✦ Revolving loan funds and loan loss reserves
  - ✦ Energy savings performance contracting
  - ✦ Commercial PACE, bundling of smaller projects
2. **Promoting distributed and small-scale clean energy generation**
3. **Electrification of the public vehicle fleet**



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# Support community-scale marketing for clean energy and energy efficiency

## Local consumer-to-consumer and business-to-business marketing optimized for our compact state

- ✦ Take economic lessons learned from 10 years of clean energy and energy efficiency incentives to educate target segments
- ✦ Utilize the latest approaches in behavioral psychology and enabling technologies to create demand
- ✦ Provide financing solution that meets modest hurdle rates of target demand segments



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# Legislation will be necessary

- ◆ Assess organization structure
  - Independent nonprofit
  - Quasi-public
  - Revolving loan fund within state government
- ◆ Provide a wide variety of financing and investment authority for qualified clean energy and energy efficiency projects
- ◆ Require authority for access to state, federal, and private funds, as well as necessary hiring and contracting authority
- ◆ Include safeguards for oversight, transparency, and accountability



Pass enabling legislation for Performance Contracting in public buildings and Commercial PACE

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# Appendix



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## ADDITIONAL NOTES

### + STRUCTURE

- Could be a new not-for-profit – possibly administered by a third party (VT and OR take this approach)
- Or could put it in an existing quasi-public entity for them to administer as outlined through a third party

### + BONDING AUTHORITY

- Partnership can be established with existing entity in state with bonding authority or Green Bank should be established with bonding authority
- The Connecticut Green Bank could issue bonds that could be guaranteed by a federal financing entity known as the "Energy Investment Trust," thereby eliminating the risk default while investing the proceeds in clean energy and energy efficiency activities that would create jobs in the state of Connecticut

### + USE(S) OF FUNDS

- Strategies to leverage public funding with private sector investments and provide competitive loan rates
- e.g. interest rate buy-downs, credit enhancements (loan loss reserve fund, loan guarantees, etc.) to achieve potential leverage of public sector dollars with private funding of \$5-20:1

- Direct lending through a revolving loan fund

- Program development, administration and technical assistance to municipalities for Energy Savings Performance Contracting and Property Assessed Clean Energy

### ROLE IN ENERGY SAVINGS PERFORMANCE CONTRACTING (ESPC)

- Program management: provide municipalities and school boards with technical assistance with project design
- Financing: serve as aggregator smaller projects
- Note: Enabling legislation needed to let State and municipalities enter into ESCO contracts

### ROLE IN PROPERTY ASSESSED CLEAN ENERGY (PACE)

- Program management: provide municipalities with technical assistance for program design/implementation
- Financing: serve as aggregator for bonding (can't have all 169 municipalities doing this on their own)

### + THIRD PARTY ADMINISTRATION

- For program administration and various financing delivery models including structuring of revolving loan fund, raising capital, lending

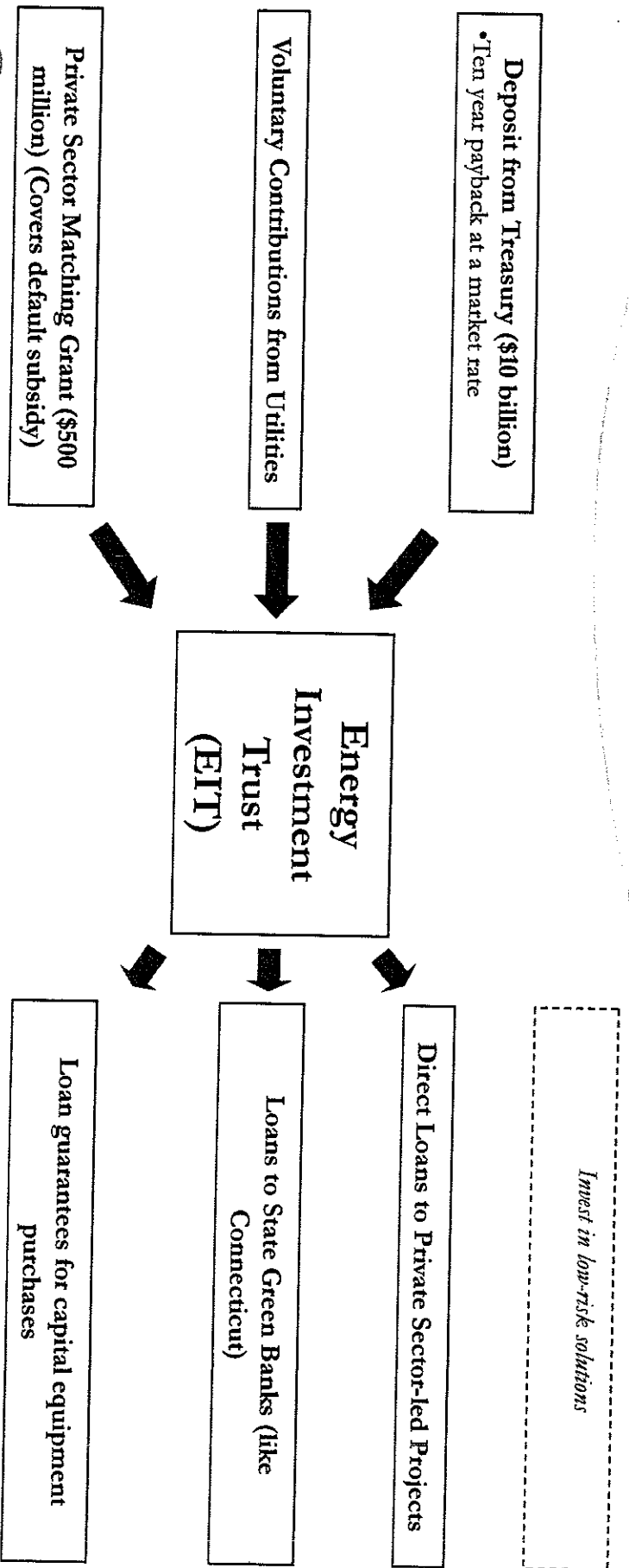


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# Connecticut Energy Investment Fund could also be funded by a national Energy Investment Trust



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# The benefits of low-cost, long-term finance are clear: Solar

## Assumptions:

### Market Financing

### EIT Financing

CAPEX - Northeast (Rhode Island)	[\$/kW]	\$4,180		\$4,180
CAPEX - Plains (Kansas)	[\$/kW]	\$4,190		\$4,190
CAPEX - Southwest (Arizona)	[\$/kW]	\$4,190		\$4,190
Tenor	Years	10		20
Solar Case/Coverage	DSCR	1.40x		1.30x
Interest Rate	[%]	6.8%		4.5%
Balance at Maturity		Balance Fully Repaid		Balance Fully Repaid
IRR to Equity (Leveraged)		11.0%		11.0%
Revenue Requirement (2012 Power Price) @ 2% Escalation				
Northeast	[\$/MWh]	\$152/MWh		\$118/MWh
Plains	[\$/MWh]	\$140/MWh		\$109/MWh
Southwest	[\$/MWh]	\$112/MWh		\$87/MWh

- Low-cost financing reduces the delivered electricity prices of solar photovoltaic projects by 20-25%, this puts solar within striking distance of current peak power prices, and generates electricity at the time when its most needed (peak hours) at the location where its most needed (close to the load).

- With low-cost financing provided by the Energy Independence Trust, the investors' internal rate of return can be maintained while keeping the cost to consumers at or below current delivered peak power prices. The cost of delivered electricity is reduced by \$25-34/MWh because of low-cost financing offered in the right column versus currently available bank financing in the left column.

## Notes:

- CAPEX is the EPC price of a solar photovoltaic system priced at \$3.75/W, plus \$.25/W debt service reserves, \$.08/W development expenses, \$.04/W financing fees, \$.06/W for interest during construction, working capital, and maintenance reserves.
- Project is depreciated using MACRS, and assumes a 30% investment tax credit
- Both projects assume the same system sizes, production, O&M, etc.
- Production estimates for each region:
  - Northeast: 1208 kWh/kWp
  - Plains: 1382 kWh/kWp
  - Southwest: 1675 kWh/kWp
- Assumes a 1MW distributed generation project.

# The benefits of low-cost, long-term finance are clear: Wind

Assumptions:		Market Financing	EIT Financing
Capex - East	\$/kW	\$1,963	\$1,963
Capex - Plains	\$/kW	\$1,813	\$1,813
Capex - West	\$/kW	\$1,739	\$1,739
Tenor	years	10	20
Wind Case / Coverage	DSCR	P50 wind @ 1.4x free cashflow	P50 wind @ 1.3x free cashflow
Interest Rate (1)	[%]	6.75%; LIBOR + 300 bps	4.5%; Treasury + 65 bps
Amortization Schedule		Equal over 10 years	Equal over 20 years
Balance at Maturity		Balance fully repaid	Balance fully repaid
Project leverage		20%	34%
IFR to Equity (leveraged)		11.0%	11.3%
Revenue Requirement - 2012 Power Price @ 2% annual escalation			
- East - @ 35% NCF	\$/MWh	\$70/MWh	\$57/MWh
- Plains - @ 44% NCF	\$/MWh	\$50/MWh	\$40/MWh
- West - @ 38% NCF	\$/MWh	\$55/MWh	\$45/MWh

Low-cost financing reduces the delivered electricity prices of these actual wind projects (above) by 15-20%; to the point of being cost-competitive with new-build conventional coal and gas-fired power plants in each region to meet incremental energy demand growth:

• With low-cost financing provided by the Energy Independence Trust, the internal rate of return can be maintained while keeping the cost to consumers at or below current delivered electricity costs (see highlighted sections above, where the cost of delivered electricity is reduced by \$10/MWh because of the low-financing offered in the right column versus available bank financing in the left column).

Prepared by an energy investment firm using public data sources

## Notes:

- Assumes that all after-tax free cashflows from the project are financeable, net of cover ratios
- CAPEX costs do not include significant transmission system upgrades
- The CAPEX here is based on reported project cost data for the ARRA grant program through November 2009, with a 10% discount to account for reductions in equipment costs since 2009 in projects being built in 2011 and 2012 timeframe
- The two cases describe the identical project, but commercial banks will finance a more conservative wind case (requiring the 1.4x cover ratio)
- The two cases assume the sale of identical quantities of electricity
- Note (1): LIBOR rate based on LIBOR swap curve for last 5 years, Treasury based on rates for the same period.